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ABSTRACT

The problem of information and documentation in educational research and development is discussed in this European study. The relationship between the problem of information and documentation and the design of research and development is described. The narrative also includes: (1) the constituent parts of the problem of information and documentation, (2) information networks, (3) information structures and information processing, and (4) special problems of the EUDISED Project. (WCM)

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ORGANISATION OF NATIONAL EDUCATIONAL R & D INFORMATION AND COMMUNICATION SYSTEMS

An analysis guide
prepared by

Bertil Gran
Lecturer, Department for Educational Research,
School of Education
Malmö, Sweden

and

Sixten Marklund
Professor, National Board of Education
Stockholm, Sweden

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THE NATIONAL INSTITUTE OF EDUCATION DISSEMINATION PROGRAMME

1. THE PROBLEM OF INFORMATION AND DOCUMENTATION IN EDUCATIONAL RESEARCH AND DEVELOPMENT

1.1 How does educational research and development come about?

The problem of documentation and of the dissemination of educational research and development results is just one part of the wider problem of how the education system as a whole can best be developed and improved. The concepts of development and of improvement only become meaningful when they are related to the goals that are established and striven for in order that education may benefit the individual and the society of which he is a part.

For this reason the problem cannot be reduced to one of documentation alone. The most technically perfect system for the systematisation, storage and dissemination of research information runs the risk of lying unused, if it is not incorporated into the policy and strategy adopted in the national school systems. Whether the direct responsibility for such a policy or strategy rests with the central, regional or local authorities is of less importance.

In the efforts to develop and improve the school system, is any real use made of educational research and development? The member states of the Council of Europe have answered a number of questions on this point when responding to a questionnaire from the Council for Cultural Co-operation (Educational research policy in European countries: 1973 survey).

Who is responsible for initiating educational research work? Is it "free" or commissioned research? With regard to commissioned research, who decides the priorities for the various research and development tasks, and according to what criteria? Is, for example, a balance maintained between the demands that the research should develop theories and the demands that the research should solve problems experienced in the education system? How and by whom are these demands then weighed against the demands made from quarters concerned with researcher training?

1.2 Why is the dissemination of information considered inadequate?

1.2.1 Are the research tasks chosen uninteresting?

One of the most frequent complaints made about educational research and development work is that the questions investigated are unimportant and irrelevant,

and this is said to be the reason why there is no demand for information on its results, and consequently no dissemination. Do the presumptive consumers of the results participate in the choice of research projects and in placing them in order of priority? Do they in the initial phase of a research project have any opinions on how the project should best be conducted, in order to facilitate the dissemination of information and of documentation concerning the results?

1.2.2 Is the research isolated from the development work?

Another complaint, closely connected with that mentioned above, is that researchers cut themselves off from the development work, which must accompany research if the results are not to be neglected.

Development work implies a translation into practical action, into teaching means and methods. Who ensures that research results are arrived at in such a way as to permit the easy association of developmental work? For example, do representatives of those producing study materials participate in projects from the initial planning stage? If so, on whose initiative, how and with what effect? Conversely, does experimentation and development work ever expand to research projects?

1.2.3 Is the research too one-sidedly "educational"?

Another factor that is of significance for the dissemination of information is that not only educationalists should be involved in educational research and development work. Because of education's many dimensions, psychologists, economists, sociologists, political scientists and information experts should also be involved. This is important not only because the nature of the research presupposes interdisciplinary work, but also because it promotes the dissemination and use of results. Whose responsibility is it to see that educational research is interdisciplinary? Is there any special joint body for this purpose?

1.2.4 Does the language used by the researchers make communication with the consumers difficult?

The complaint is often heard that information on educational research results is written in such a technical and obscure language that it is impossible for the recipient to understand it. Is this complaint justified? Would a wider circle of consumers be reached if the reports were to be simplified and popularised?

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The material must still be read and used, however. It must be consumed and digested. And the rule that applies here is that it is only the hungry who eat. A hunger for information is required in the target group at which the information is directed. Thus the best way of solving the problem of information and documentation is by managing to involve the recipients personally.

If the existence of this involvement and this "hunger" is the first condition for the spreading of information, the second condition is that the personal involvement must include all parties - researchers, consumers, transmitters and receivers.

A third condition is that the measures taken by the transmitters to provide information and the measures taken by the receivers to obtain and use information must be co-ordinated. If these 2 parties work independently, which is often at present the case, the desired effects fail to materialise.

These 3 conditions lead to the conclusion that the information and documentation (I-D) problem is a problem of communication. Thus we are not concerned with a one-way flow of information. From the point of view of those producing research and development (transmitters), the communication process can be seen as a diffusion of information, while from the users' (receivers') point of view it can be regarded not merely in terms of reception but also as an active search for information.

2. THE RELATION BETWEEN THE INFORMATION AND DOCUMENTATION PROBLEM AND THE DESIGN OF R & D

The pattern of communication between researchers and those using the research results is dependent on the pattern followed in designing the research and development work. Several different theoretical patterns have been developed. From the point of view of information and communication, these can be divided into 2 groups, which are here called the R & D model and the problem-solving (PS) model.

2.1 The R & D model

The most significant feature of the R & D model is its systematic categorisation and sequencing of the different stages in the innovation process. These are usually the following:

1. basic research;
2. applied research;
3. development and testing of method and media prototypes;

4. production of learning and teaching systems;
5. planned distribution and application.

Here innovation starts from the knowledge obtained from research. It presupposes a logical and rational succession of measures. By means of a series of built-in mechanisms for checking and adpatation, the application of the model is assumed to lead to effective innovations. The model has proved to be successful in easily defined tasks, such as job training and retraining.

From the information point of view, the model has certain weaknesses, perhaps mainly because it assumes a degree of passivity on the part of the consumer. Also the consumers often wish to apply the results in a freer and, from a research angle, less rational way.

2.2 The problem-solving (PS) model

The PS model is less structured that the R & D model. The starting point here is not primarily in the knowledge obtained from research, but in the need experienced by the consumer for an innovation. The steps are usually the following:

1. the consumer's experience of a need for innovation;
2. definition of the problem;
3. diagnosis of the prerequisites;
4. collection of necessary information;
5. construction of a solution;
6. evaluation and application.

Taken individually, each one of these steps can be included in the R & D model. But within the PS model their internal relations are different. It is possible that the researcher does not participate from the beginning. The model presupposes that the consumer both can and should define the problem. The researcher then comes in more as a resource than as a leader.

The strength of the model from an innovation point of view is that the consumer actively seeks information. Paradoxically, however, this is also the model's weakness. The information he seeks can be based on an isolated or unrealistic need. Socially, economically and politically, the reality within which the consumer wishes to make innovations may need to be changed. The frames and structures that are by him unquestioned are perhaps exactly what needs to be changed in order to solve the problem. A solution suitable for one consumer may be unusable by another.

2.3 Can the R & D model and the PS model be combined?

From the consumer's point of view, the R & D model provides innovations that come from outside and are incorporated into the education system. The PS model provides innovations from inside the system. The PS model is important, perhaps indispensable, since it produces involvement and a hunger for information. But it is inadequate. The R & D model is required as a complement, in order to shed light on questions that other consumers are interested in.

The above references to "outside" and "inside" are based on the idea that the researcher stands outside the education system and the consumer within it. The education system must be expanded to include educational R & D so that the researcher (the transmitter) forms a unit with the consumers and recipients, ie teachers, pupils, school principals, school administrators, educational policy-makers etc.

How do the European education systems view this way of using research? How do they view this way of providing information on research results? How do they view this way of promoting a demand for such information? Is the R & D model the one that occurs most frequently? Or is the PS model more often applied? Have any official statements or decisions been made in favour of one model or the other? Is this question left unanswered by educational and research policies? Have questions concerning information been discussed on the basis of the points given here for each model? Who can and should be responsible for seeing that educational R & D is given a structure that will increase the extent to which the results are used?

3. CONSTITUENT PARTS

3.1 Transmitters

The transmitters of information resulting from educational research and development work are primarily the researchers themselves and those who plan the scope, direction and content of the research. These people are to be found both in research institutes and in central, regional and local authorities and organisations. Researchers are also employed by private companies, eg, producers of textbooks and audio-visual aids.

Are there within the member states of the Council for Cultural Co-operation one or more central bodies, governmental or non-governmental, which bear the main responsibility for how research results are to be

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distributed? What do researchers and research institutes feel about their role as conveyors of information to the consumers? Do they consider that "selling" research is a normal part of research work? Is it usual to include in a research project an information package and to calculate the cost of the project with this in mind? Is the design of the research project usually dependent on the target group at which the subsequent information is to be directed?

3.2 Receivers

3.2.1 Information to other researchers

Research results have to be critically appraised by other researchers, in order to promote further scientific development. Communication from one researcher to another is the classical pattern of diffusion and receipt of research findings. This pattern remains both valid and important. We must never compromise in our demand for complete and accurate information, no matter how indigestible it may be to the layman. But nowadays it is no less important for the knowledge and information produced by research to be made available to others than researchers. This "translation" of theoretical knowledge into practical action is, in the long run, a condition for the survival of science even in the narrow sense. To this must be added the fact that the scope of contemporary research is so wide that even the trained scientist needs help in the form of summaries, surveys, trend reports and classification of research data.

How do researchers experience the problem of keeping themselves informed? How is a balance achieved between complete information and an overview?

3.2.2 Key persons in education

The recipients of R & D results include educational planners, administrators and decision makers at central, regional and local levels within the education system. This group also includes qualified experts as advisers, curriculum designers and test makers.

Are R & D results popularised, or in other ways diluted to make the information more accessible to these key persons? Are there special courses or information services to facilitate the use of R & D information by these key groups? If so, who is responsible for this?

3.2.3 Teacher trainers

It is generally found that teacher trainers tend to keep to well-tried methods and means, and to be reluctant to take the risk involved in experimenting

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with new ones. How can we change the teacher trainers' attitudes in this respect? This is extremely important, as this group of persons also forms a link with new generations of teachers. Can educational R & D be organised in such a way that teacher trainers get involved? Is there any evidence on how to combine a teacher training function with a research function?

3.2.4 Teachers and students

The most important groups of receivers are, of course, the teachers and their students. Information on research and development results comes to them indirectly through new curricula, new educational materials, textbooks and new procedures in teaching, but also directly through courses, reports and articles in periodicals.

What is in general the attitude of the teachers and students towards R & D results? Is it possible to say that there is any real hunger for information within these groups? What have been the effects (if any) of publishing R & D results in teacher journals? What (if any) have been the effects of spreading R & D results by means of in-service training for teachers?

3.2.5 Educational supplies

Producers of educational materials have a great need of access to R & D data. Above all they want to follow the development of educational materials from the earliest stage. Is there any organised co-operation between researchers and producers, between developers and producers? Do the producers have associations which safeguard their interests as far as the need for information is concerned?

3.2.6 Parents, general public, mass media

The public at large is usually only affected indirectly by R & D results. It has been considered important, however, that research results be made available to the general public to enable it to follow developments in the schools. The results enrich the general debate and contribute to the development of the school system by undermining views based on prejudice and convention. How and to what extent do the researchers themselves help to spread information on a wide scale through the newspapers, radio, TV, parent associations etc? Are special information officers appointed to maintain contact with the mass media?

3.3 Linking personnel and linking functions

Several of the receiver groups described above are also responsible for forwarding information to other recipients. This is the case with teacher trainers, those providing

in-service training for teachers, study material producers and the mass media. They are receivers but not direct consumers. They try to get other receivers to use the information.

Which groups of linking personnel do the researchers make use of when they wish to spread information? On which groups do the consumers rely? Is the system of having reference groups attached to the research projects common? In what does the linking function consist? Is it, for example, possible to convey research information to teacher groups by any means other than direct and oral mediation? Does it happen that linking personnel "translate" research results into further training programmes for teachers?

4. THE NETWORK

4.1 Relations between the different systems

So far the discussion has concerned producers and consumers of educational R & D information. In this section the systems or networks which transmit the information will be analysed. A network is defined according to nodes (institutions) and to the nature of the information handled. We are here interested in institutions handling information on educational R & D activities.

The main purpose of the information is to mediate new knowledge. Such knowledge is produced in different ways within the educational sector, eg,

- by research, developmental work and experiments;
- by planning and investigatory activities;
- by statistical surveys;
- by the production of study materials and other media;
- by laws and statutes.

Here we place the emphasis on the first type of knowledge production. The relation to other information must also be taken into consideration, however. If it is assumed that systems of information and communication for educational R & D activities should be open systems, then being open to other educational information is important. But openness and contact are also important in other respects. How, for example, is information from other countries absorbed and utilised? Other questions involve

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the connection between educational research and other research, and between the documentation systems and the library service.

4.1.1 The relation to foreign information

How do people gain access to R & D information produced in foreign countries? Does responsibility rest with individual researchers, with institutions, on the local or the central level? Is there any special service? What does it comprise? Does it only cover certain language areas?

4.1.2 The relation to other research

It is difficult to delimit the educational field in an unequivocal way. For this reason it is of great importance to see how systems for educational information are related to other subject areas. How, for example, is information on educational R & D work transmitted to other subjects and work areas? How can other research information be brought into the educational field? To what extent is there any specific organisation for the educational sector? In particular the relation to research in the behavioural and social sciences needs to be examined thoroughly.

4.1.3 Sub-systems within the educational field

To what extent does educational R & D information also cover new areas of knowledge in the field of education, eg, planning and investigatory activities, educational statistics and study materials? There are often different "in-groups", each of which has its own more or less closed I & D system. Information is passed from researcher to researcher. What is this system like? Study material producers may have their own information system incorporating study material producers, a study material centre and study material registers. School psychology work, involving use, for example, of diagnosis instruments, can have its own I & D system. For disseminating information to teachers there is also often a special system involving special linking persons, teacher organisations, teacher centres etc. What connection do these systems have with each other? In particular, what connection do these systems have with research and research information?

4.1.4 The relation to the library service

Information can be transmitted in many different ways: orally, in writing, by pictures and sound, etc. The dissemination of information can take place through various networks between separate producers and consumer

groups. The documentation is based on texts that are stored and disseminated in varous ways. How independent/dependent is the system for the dissemination of information? Is there a documentation system that is independent of the library service? How mechanised or automated is the library service?

4.2 The relations within the system

While the above analysis concerned the relations that exist between I & D systems for educational R & D activities in an open system, the analysis here takes up different sub-aspects of I & D systems for R & D knowledge within the educational field. Three types of organisation can be differentiated (according to UNISIST, 1971):

1. geo-politically based systems;

2. discipline or mission-oriented systems;

3. function-oriented systems.

4.2.1 Geo-politically based systems

The relation between central, regional and local organisations is an important question. What status do different I & D centres have? Is there a hierarchical structure? The arrangement of the I & D system at the local departmental level should be described. Who has access to the various centres? Is there a separate service for each language area?

4.2.2 Discipline or mission-oriented systems

Here we refer to sub-systems within the educational field or, for example, to information and documentation centres of a more interdisciplinary nature. Examples of such specialised organisations are I & D systems for pre-school education, adult education, language teaching. Such centres can be directly incorporated in a more international system. What contact is there with other national documentation or library systems or consumer group?

4.2.3 Function-oriented systems

There are a number of different tasks within the processing of information in which particular institutions, organisations, etc have specialised. Often information in fields other than education is also dealt with. Translation services and reproduction services are typical examples. Are such activities designed to be private or official?

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Data-processing is also usually dealt with by special centres. Which data tapes are available? Where? Who has access to them? Co-operation with other countries? Access to microfiches or to a microfilm service?

4.3 Maintenance and development of the system

If an I & D system is to function adequately, continuous maintenance and development of the system is required. Four points have then to be taken into consideration:

1. organisation for planning, co-ordination, etc, of the I & D system;

2. staff with specifically service tasks within the system;

3. training that is connected with utilisation of the system;

4. R & D work oriented towards the I & D system.

These 4 maintenance and development areas can also be applied to the utilisation of the system as regards aspects such as those taken up in section 5. It may be more appropriate to analyse them here, however.

4.3.1 Planning and co-ordinating functions

Is there a central agency or something similar with the task of co-ordinating I & D activities? Is it specifically for the educational sector? What is its official status? What are the tasks of this type of co-ordinating body? Surveillance of system and programme matters, standardisation, control of standards, etc? How is international co-operation arranged?

4.3.2 Service personnel within the I & D system

This category does not include linking personnel such as teacher trainers, consultants, journalists, etc. Are there documentalists, programmers and the like linked to the service units? What are their tasks? What educational background do they have? What connection is there with library staff?

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4.3.3 Training for the I & D system

This concerns 3 main groups of personnel:

a. producers of information, primarily researchers: is training in I & D questions included in the researcher training? What does it comprise?

b. service personnel within the system: special training for documentalists, training of library staff, especially in more mechanised and automated functions;

c. consumers within the system: training of the linking personnel, training or information for administrators, teachers, etc.

4.3.4 R & D work in the I & D field

Are there scientific institutions which carry out R & D work in the I & D field, especially relevant to education? Examples of research problems.

5. INFORMATION STRUCTURES AND INFORMATION PROCESSING

This analysis has so far dealt primarily with producers, linking personnel and consultants on the one hand, and the organisation of the actual I & D system on the other. The questions now taken up will cover both the content or message that is to be conveyed and the problems that are connected with procedures in the processing of information.

5.1 Different information structures

Depending on the target group, the information can be designed in different ways. Here only printed material, ie documentation, is considered. This can be classified in different ways. With regard to matters concerning EUDISED, it may be appropriate to differentiate between:

a. primary documents;

b. bibliographical documents;

c. summarised information;

d. analyses.

5.1.1 Primary documents

By this we mean the original scientific report (or equivalent) or article. How is it usually published? Are scientific journals published within the country?

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In what language(s)? Do the research institutions publish their own report series? In what form? Stencilled? How are such reports distributed? How do they reach the documentation and/or library services? Which languages are used? How many are sent abroad?

5.1.2 Bibliographical documents

Systematic and periodic documentation about documentation, ie, bibliographies with lists of reports, articles, etc. Coverage? How specific are the areas dealt with in such bibliographies (if any)? Do they encompass more than education or only certain parts of education, eg adult education? Are there organisations that publish collected educational information in the form of annual bibliographies or the like? How long does it take to publish such bibliographies? Which language is used?

5.1.3 Summarised information

Information to various target groups has been covered earlier. Here we are only concerned with summarised information in the form of, for example, newsletters, project summaries, bulletin sheets,etc. This category also includes monthly and cumulative subject indexes. Who publishes such summarised information - institutions, documentation centres, regional or central authorities, etc? Is information given about current projects? Which languages are covered? What are the circulation and coverage?

5.1.4 Analyses

The documents referred to here are those that evaluate, summarise and discuss, and that appear regularly. To what extent do they exist? What are their target groups? Who are the writers - researchers or others? Are they published by central or regional organisations?

5.2 Analysis and storage of information

To what extent are special measures taken at the input stage to facilitate the search for and acquisition of information? Examples of such measures are:

a. abstracts;

b. classification and indexing;

c. selection of documents;

d. storage on microfilm and microfiche (optical methods);

e. utilisation of computer techniques.

5.2.1 Abstracts

The existence of abstracts facilitates the search for information, and storage on, for example, microfiches or computer tapes can also be made easier. Are there special abstracting services? Do special rules (abstracting standards) apply within the country, centrally or locally? Who writes the abstracts? The author himself or someone else? In which language?

5.2.2 Classification and indexing

Each document that enters a library system is classified. What system is used for this? Is there also an automated registration system? Have standards been worked out for this?

Is some other document description language used for educational documents? Are documents supplied with indexes or keywords? Who carries out such indexing? Which type(s) of documents? Language?

5.2.3 Selection of documents

In view of the amount of educational information produced, it is important to have some form of selection, particularly in cases where the information is directed at special target groups, or when it is to be included in summaries or analyses. Is there any mechanism for this? Criteria? By whom is it done?

5.2.4 Optical storage methods

Within the library service the most common method of storing written texts is the book. However, methods using microfilm or microfiches are steadily gaining ground. Not least important, such methods make transport cheaper and easier. To what extent is educational R & D information stored in this way? Documentation centres? Individual institutions? Does apparatus for reading and/or copying exist on a local level?

5.2.5 Utilisation of computer techniques

Is educational documentation stored on computers now, or is such storage being prepared? Where and by whom? To what extent? Is it intended that the information be produced within the country and/or in other countries? Language area?

Are computer techniques used for other operations within the documentation service, eg, for ordering, addressing, etc?

5.3 The acquisition of information

5.3.1 Documentation service

A documentation service has wide tasks. It may, for example, carry out:

a. isolated searches (often also retrospective) within certain clearly defined subject and language areas and also within subject areas that are particularly difficult to delimit;

b. continuous surveillance (current awareness services) within given areas;

c. information analysis and state-of-the-art reports;

d. special services with regard to acquiring, copying, translating, etc.

A documentation centre can, of course also have tasks concerned with the collection and presentation of information and its distribution to chosen target groups. When analysing documentation services, it may be necessary to state what type of information is referred to, who requires the information, why it is required and how it is to be used.

Documentation centres may also participate in the maintenance and development of the documentation system itself.

How did this kind of documentation service develop within the country? Is there a special service linked to local institutions or authorities?

5.3.2 Computer-based services

The tasks mentioned in the point above can, of course, be carried out by hand. A great deal can be gained, however, in terms of time and efficiency by the use of computer-based services. Are there any such services within the country, or are services in other countries used? What information is available? Where? What is the extent of this information service? Does it operate selective diffusion of information (SDI) services (current awareness function)? Retrospective searches? Who makes use of the SDI services? Who operates the SDI services? Has the information seeker

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direct access to the system? Are there data terminals, which can be used for documentation purposes? Which search methods are used? Are "standardised" search strategies of, for example, the ERIC type used? Who designs the search profiles - the consumer himself or a documentalist?

5.3.3 Feedback and communication

A person when seeking information expresses an individual need. How well does the information received correspond to this need? What communication occurs between the person seeking information on the one hand, and linking personnel, documentalists and researchers on the other? Is there any system for feedback? How are the consumer's points of view taken care of? Are there examples of need studies, consumer studies, contact studies, studies of means of information dissemination, etc?

6. SPECIAL PROBLEMS AS REGARDS THE EUDISED PROJECT

The above analysis should in itself provide a basis for assessing the opportunities and difficulties the country has with regard to participating in a computer-based international information and documentation service. In conclusion, however, it may be necessary to examine a few aspects in more detail. Examples of some such important areas are:

1. future developments;
2. the relations between the various parts of the information system;
3. techniques for input and output in a computer-based system.

6.1 Future developments

In relation to EUDISED, 2 main aspects should be stated, namely the envisaged automation of documentation systems, and the development of centres, service institutions etc, within the educational sector. Particular attention should be paid to whether special national centres or the like can serve as national agencies in an international system.

6.2 The relation with the various parts of the information system

If EUDISED is to be of real use to the various member countries, the system which is developed must not be a closed one for communication between education researchers only. It must be possible for it to reach out to what can be called the educational community at large. What measures

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have been taken or are expected to be taken so that newly produced educational knowledge - especially from R & D work - can reach decision makers, teachers, etc? Furthermore, it is important that the information system be able to accept types of educational documentation other than R & D work, eg statistical data and study material information. How can such information be brought to national or regional centres?

6.3 Techniques for input and output in a computer-based system

The structuring of information by using a thesaurus is an important aspect. If a thesaurus other than the multilingual EUDISED thesaurus, eg, ERIC or UNESCO, is used, is it envisaged that preference will be given to the EUDISED instrument?

As far as transmission standards are concerned, have the ISO standards been accepted or will they be (cf EUDISED standards, format, character representation, 1973)?

The question of a central national co-ordination group or secretariat in order to maintain and develop systems and standards should be seen in the context of the planned development of EUDISED.

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A P P E N D I X

THE NATIONAL INSTITUTE OF EDUCATION DISSEMINATION PROGRAMME (1)

The US National Institute of Education (NIE) is currently supporting 6 major types of dissemination activity.

A. The Educational Resources Information Centre (ERIC), a national system for education information, continues to add bibliographic references to its files, to publish indexes to those files, and to produce and sell microfiche and hard copy duplications of documents accessed by the system. "Regular" ERIC products include:

1. Research in Education (RIE), a monthly abstract journal which describes the documents recently added to the ERIC collection;

2. Current Index to Journals in Education (CIJE), which references articles in education related journals by topic and author;

3. The entire ERIC document collection on microfiche, subscribed to by organisations providing education information services;

4. Individual copies in print or on microfiche: ERICTAPES, magnetic tape storage of the RIE and CIJE data bases, which can be computer searched by a vareity of software packages; and ERICTOOLS, a series of indexes, directories and cross-referenced lists for searching the ERIC document collection manually.

B. Research findings on topics of particular interest to education practitioners are analysed and rewritten in formats designed for application. Current topics for "interpretive summary" projects include: Teacher Training

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(1) Document distributed at the 4th meeting of the Advisory Committee on Educational Documentation and Abstracting Services (Geneva, 4 - 7 June 1974), and included here on the initiative of the Secretariat.

and Teacher Attitudes, Social and Cognitive Development of Children, Individualising Instruction, Educational Planning, Test Scores as a Basis for Allocating Resources, Creative Problem Solving, Teachers of Adults, and Peer Tutoring.

C. NIE is exploring alternative publishing arrangements with government contractors, including sliding-scale royalty payments as a means of creating incentives for commercial investment in education product delivery and of encouraging wider dissemination of education information and education products.

D. A major programme is underway to improve the information services now supported by NIE. Improvement activities will focus on technology development for better access to the system, and on delivery of services not now offered. NIE will support development of new methods of document surrogation, document storage and retrospective computer searching. New services will include:

1. A nationwide question-answering and informational retrieval service for educators with free telephone access;

2. Access to additional data bases - resources in education which are outside the scope of the report literature, such as non-print materials, organised reference to people (human resources), descriptions of education practices, products and programmes identified as "promising", and legal information;

3. access to report literature by additional descriptors such as type of document.

In addition, a study to re-examine the entire problem of education information will begin on 1 July 1974. This study may well lead to radical changes in the delivery of education information.

E. There are several educational R & D laboratories in the United States which produce curriculum training and evaluation materials for practitioners at many organisational and administrative levels in the education system. In order to stimulate the widespread use of successful Lab products, NIE supports dissemination projects for those products that have been evaluated as promising. About 10 products will receive such treatment this year.

F. NIE's dissemination programme is not limited to direct support of information services. NIE also supports research on the entire knowledge production and utilisation system in education and on its component parts. One programme focus is on monitoring the R & D system in education - identifying and describing the institutions which produce and use knowledge. Another programme focus is on building the capacity of individual practitioners to use information and of intermediate agencies in the education community to act as links between the practitioner and information resources. A study of training needs and support of a training programme for practitioners and for intermediate agency personnel is planned for next year. NIE continues to support the design, testing, evaluation and operation ofdissemination activities in state education agencies as a major effort to link practitioners with national information resources.